

AMENDMENTS TO THE CLAIMS

1. (currently amended) A door apparatus, comprising:
a door movable in opposite opening and closing directions;
a door driving device for applying a thrust force to the door to move the door;
a lock device for performing a locking operation and an unlocking operation on the door; and
a control apparatus ~~means~~ for controlling the door driving device and the lock device,
wherein, if the control apparatus ~~means~~ controls the lock device to perform the unlocking operation, and thereafter the lock device is determined to be still in a locked state even after a set time, the control apparatus ~~means~~ controls the lock device to perform the unlocking operation while controlling the door driving device to output a thrust in either at least one of the opening direction or and the closing direction, to unlock the door.

2. (currently amended) A door apparatus according to claim 1, comprising:
~~—— a door movable in opposite opening and closing directions;~~
~~—— a door driving device for applying a thrust force to the door to move the door;~~
~~—— a lock device for performing a locking operation and an unlocking operation on the door; and~~
~~—— a control apparatus for controlling the door driving device and the lock device;~~
~~—— wherein, if when the control apparatus controls the lock device to perform~~

the unlocking operation and the lock device is thereafter determined still to be in a ~~the~~ locked state after a ~~the~~ set time, the control apparatus controls the lock device to perform the unlocking operation while controlling the door driving device to output a ~~the~~ thrust in both the opening direction and the closing direction.

3. (original) A door apparatus according to claim 1, wherein the control apparatus controls the door driving device to output a large thrust and a small thrust alternately in the same direction, and controls the lock device to perform the unlocking operation in synchrony with the timing of the changing of the large and small thrusts.

4. (original) A door apparatus according to claim 2, wherein the control apparatus controls the door driving device to output a thrust in the opening direction and a thrust in the closing direction alternately, and controls the lock device to perform the unlocking operation in synchrony with the timing of the changing of these opening direction and closing direction thrusts.

5. (previously presented) A door apparatus according to claim 2, wherein the lock device includes mechanical locking elements and an electrical means for disengaging the locking elements to open the lock device.

6. (previously presented) A door apparatus according to claim 2, wherein the control apparatus includes a sensor for sensing an unlocked state of the lock device, the control apparatus, while controlling the lock device to perform the unlocking operation, determining whether the sensor senses the unlocked state device before a detection time reaches the set time, and if not controls the door

driving device to output a thrust in the opening direction and in the closing direction.

7. (previously presented) A door apparatus according to claim 1, wherein the lock device includes mechanical locking elements and an electrical means for disengaging the locking elements to open the lock device.

8. (previously presented) A door apparatus according to claim 1, wherein the control apparatus includes a sensor for sensing an unlocked state of the lock device, the control apparatus, while controlling the lock device to perform the unlocking operation, determining whether the sensor senses the unlocked state device before a detection time reaches the set time, and if not controls the door driving device to output a thrust in either the opening direction or the closing direction.

9. (currently amended) A door apparatus according to claim 1, comprising:
~~—— a door movable in opposite opening and closing directions;~~
~~—— a door driving device for applying a thrust force to the door to move the door;~~
~~—— a lock device for performing an unlocking operation on the door; and~~
~~—— a control apparatus for controlling the door driving device and the lock device;~~

wherein the control apparatus further controls the lock device to perform a the unlocking operation and ~~controls the door driving device to apply the thrust force~~, the control apparatus determining whether the lock device is still in a locked state after a set time from an initiation of the unlocking operation, and if the lock

device is determined to be in the locked state after the set time, the control apparatus controls the lock device to continue to perform the unlocking operation while controlling the door driving device to output a ~~the~~ thrust force in ~~the~~ at least one of the opening direction and the closing direction.

10. (previously presented) A door apparatus according to claim 9, wherein the control apparatus includes a sensor for sensing an unlocked state of the lock device, the control apparatus, while controlling the lock device to perform the unlocking operation, determining whether the sensor senses the unlocked state device before a detection time reaches the set time, and if not controls the door driving device to output alternate thrusts in the opening direction and the closing direction.

11. (previously presented) A door apparatus according to claim 9, wherein the control apparatus includes a sensor for sensing an unlocked state of the lock device, the control apparatus, while controlling the lock device to perform the unlocking operation, determining whether the sensor senses the unlocked state of the lock device before a detection time reaches the set time, and if not controls the door driving device to output a thrust in either the opening direction or the closing direction.

12. (previously presented) A door apparatus according to claim 2, wherein the lock device includes engagable mechanical locking elements and an electrical means for disengaging the locking elements to open the lock device.

13. (new) The door apparatus according to claim 1, wherein the lock

device has a lock pin moveable in a direction normal to a direction of the thrust force.

14. (new) The door apparatus according to claim 1, wherein the control means includes;

lock device controlling means for controlling the lock device to perform the unlocking operation;

checking means for determining whether the door is locked after an initiation of the unlocking operation by the lock device controlling means; and

door driving device controlling means, responsive to a determination by the checking means that the door remains locked after a set time from an initiation of the unlocking operation by the lock device controlling means, for controlling the door driving device to apply the thrust force to the door while the lock device controlling means continues to control the lock device to perform the unlocking operation so as to reduce a force resisting completion of the unlocking operation to unlock the door.

15. (new) The door apparatus according to claim 1, wherein the lock device includes a locking pin and a lock hole, the locking pin in the lock hole when the lock device is in the locked state, the thrust applied after the set time relieving a force between the locking pin and an edge of the lock hole resisting removal of the locking pin from the lock hole.

16. (new) A door apparatus, comprising:

a door movable in opposite opening and closing directions between an open position and a closed position;

a lock device for performing a locking operation and an unlocking operation

on the door while the door is in the closed position; and

a door driving device for applying a thrust force to the door in at least one of the opening and closing directions while the door is locked; and

a control apparatus for controlling the door driving device and the lock device, including

lock device controlling means for controlling the lock device to perform the unlocking operation;

checking means for determining whether the door is locked after an initiation of the unlocking operation by the lock device controlling means; and

means, responsive to a determination by the checking means that the door remains locked after a set time from the initiation of the unlocking operation by the lock device controlling means, for controlling the door driving device to apply the thrust force to the door while the lock device controlling means continues to control the lock device to perform the unlocking operation.

17. (new) The door apparatus according to claim 16, wherein the lock device includes a locking pin and a lock hole, the locking pin in the lock hole when the lock device is in the locked state, the thrust applied after the set time relieving a force between the locking pin and an edge of the lock hole that resists removal of the locking pin from the lock hole.

18. (new) The door apparatus according to claim 16, wherein the lock device includes a locking pin and a lock hole, the locking pin in the lock hole when the lock device is in the locked state, the thrust applied after the set time relieving

a frictional force in the lock device that resists removal of the locking pin from the lock hole.

19. (new) A door apparatus, comprising:

a door movable in opposite opening and closing directions between an open position and a closed position;

a lock device, for performing locking and unlocking operations on the door while the door is in the closed position to switch a state of the lock device between a locked state in which the door is locked and an unlocked state in which the door is unlocked;

a door driving device, the door driving device having door driving means for applying a first thrust force to the door in at least one of the opening and closing directions while the lock device is in the locked state, and for applying a second thrust force to the door in the opening direction to open the door while the lock device is in the unlocked state, the door driving device being ineffective to open the door when the lock device is in the locked state; and

a control apparatus for controlling the door driving device and the lock device,

wherein the control apparatus controls the lock device to perform the unlocking operation and controls the door driving means to apply the first thrust force, the control apparatus determining whether the lock device still is in the locked state after a set time from an initiation of the unlocking operation, and if the lock device is determined to be in the locked state after the set time, the control apparatus controls the lock device to continue to perform the unlocking operation while controlling the door driving means to output the first thrust force so as to relieve a resistance to the unlocking during the unlocking operation.

20. (new) The door apparatus according to claim 19, wherein the lock device includes a locking pin and a lock hole, the locking pin in the lock hole when the lock device is in the locked state and removed from the lock hole in a direction normal to the thrust force when the lock device is in the unlocked state, the thrust force applied after the set time relieving a frictional force in the lock device, that resists removal of the locking pin from the lock hole.